STANDARD FORM NO. 64

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Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files - Contract 161, Task Order 1 DATE: 13 November 1959

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JUST 22 NEXT REV 2010 AUTH: HR 70-2

FROM : [redacted] 25X1

SUBJECT: (Trip Report - CR-17, and Discussions of Low Noise Preamplifiers for [redacted] Antenna System) 25X1

1. On 4 November 1959 the undersigned and [redacted] 25X1
OC-SP/EA, visited [redacted] 25X1
[redacted] to monitor progress on the CR-17 Collection Receiver. Participating in the discussions were [redacted] 25X1
[redacted] 25X1

2. The CR-17 is a [redacted] collection receiver. 25X1
[redacted] is using a TRF approach for this receiver, with amplification divided between the RF and video stages. The contractor is presently constructing a breadboard model of the CR-17 receiver which will prove feasibility of the design approach, and which, when debugged, will provide the basis on which the final prototype model will be built. The present schedule calls for completion of the first breadboard CR-17 by 18 November 1959. 25X1

[redacted] 25X1

4. There is a requirement to increase the sensitivity of the [redacted] antenna system [redacted]. It has been variously suggested that perhaps a maser or parametric amplifier front end might suffice to provide the necessary additional sensitivity. With rough calculations [redacted] estimated that the noise temperature at the input to such a front end for the [redacted] antenna would be approximately 150° Kelvin. With this as a starting figure it would appear to 25X1 25X1 25X1

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Trip Report - CR-17, and Discussions of Low Noise Preamplifiers for [redacted] Antenna System 25X1

be pointless to install the maser (noise temperature of approximately 10° Kelvin) as the low noise preamplifier for this system. Use of a parametric amplifier, positioned directly behind the antenna dish, would probably result in an effective noise temperature of approximately 400 to 450° Kelvin. The resulting sensitivity would be less than obtainable with a ruby maser, but not appreciably so, since the minimum noise figure obtainable is limited by the noise temperature from the antenna itself. A certain amount of sensitivity improvement could be effected at this frequency by use of a more sensitive traveling wave tube preamplifier. The Huggins HA-37 which is currently being used in that application has a maximum noise figure of about 10 db. It is possible to obtain an RCA low noise traveling wave tube which exhibits over the frequency range [redacted] a noise 25X1 figure of less than 6 db. Thus a 3 or 4 db improvement could be effected by a relatively simple change in preamplifiers. A parametric amplifier for this application would probably cost from 10 to 20 thousand dollars, and would require 4 to 6 months for delivery. The field requirement and possible solutions will be investigated further before any recommendations for system modification are made.

[redacted] 25X1

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ROUTING AND RECORD SHEET

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SUBJECT: (Optional) Trip Report - CR-17, and Discussions of Low Noise Preamplifiers for [redacted] Antenna System. 25X1

FROM: OC-E/R+D-EP

NO.

DATE 13 November 1959

TO: (Officer designation, room number, and building)	DATE RECEIVED	DATE FORWARDED	OFFICER'S INITIALS	COMMENTS (Number each comment to show from whom to whom. Draw a line across column after each comment.)
1. R+D	11/17	11/20 11-19		Information
2.				File RD-161 T.O.
3.				
4. OC-E-1		11-24		
5. OC-E				Information
6.				
7.				
8.				
10. EP				Filing
11.				Dave:- would appreciate explanation of why the par-amp would result in such a high noise temp.
12.				
13.				
14.				
15.				

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